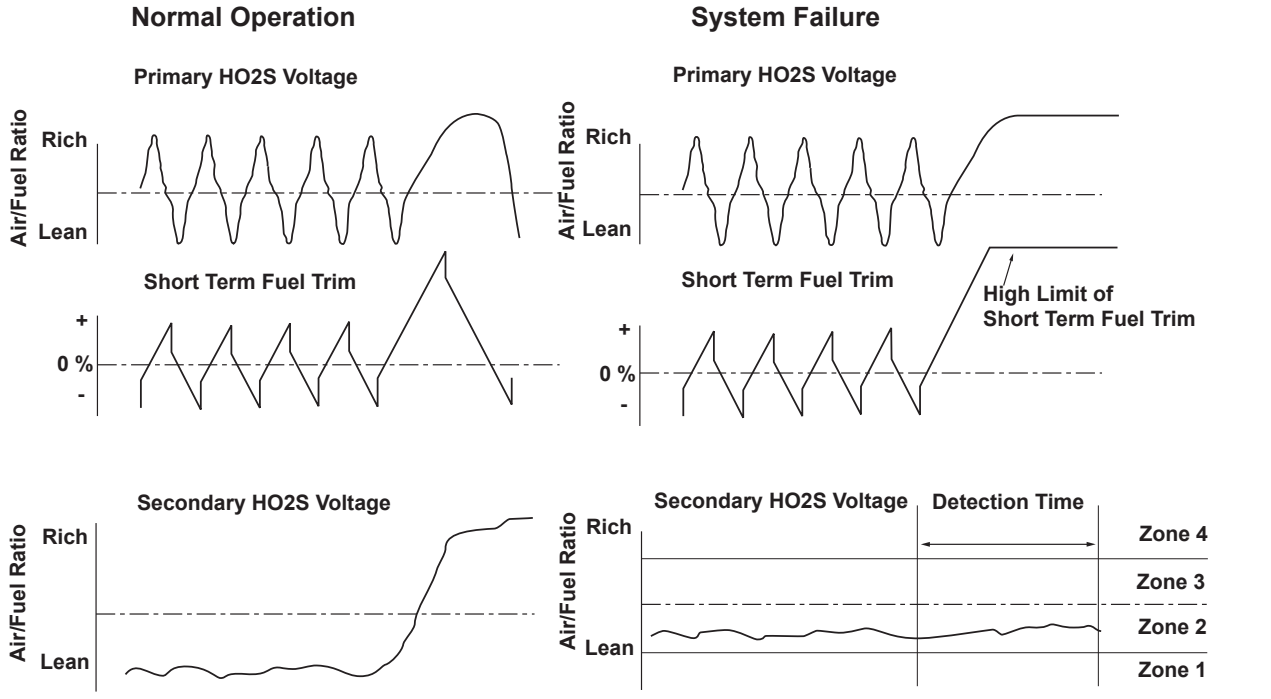
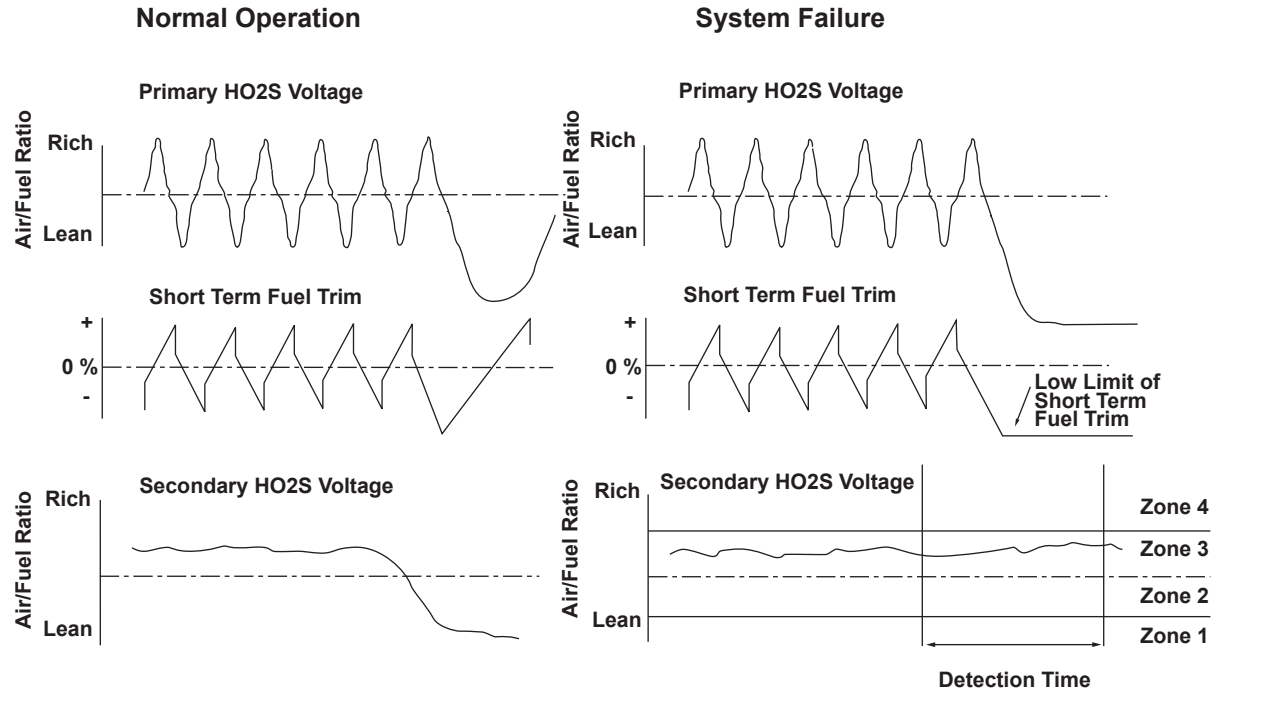
DTC P0139: Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Slow Response



P0139-9671



P0139-9672

General Description

The secondary heated oxygen sensor (HO2S) (Sensor 2) is installed downstream of the three way catalytic converter (TWC). The HO2S detects the oxygen content in the exhaust gas downstream of the TWC during stoichiometric air/fuel ratio feedback control by the engine control module (ECM)/powertrain control module (PCM) from the primary heated oxygen sensor (HO2S) (Sensor 1) output voltage, and its output voltage is used to control air/fuel ratio so that the TWC efficiency is optimized.

The secondary HO2S output voltage range is divided into four zones. If the secondary HO2S output voltage remains in the same zone during the air/fuel ratio feedback control, the ECM/PCM controls the amount of injected fuel by changing the short term fuel trim.

If the secondary HO2S output voltage remains in Zone 2 or Zone 3 after the ECM/PCM commands an increase or decrease in the short term fuel trim, a malfunction is detected and a DTC is stored.

Monitor Execution, Sequence, Duration, DTC Type

Execution	Once per driving cycle
Sequence	None
Duration	72 seconds or more
DTC Type	Two drive cycles, MIL ON

Enable Conditions

Condition	Minimum	Maximum
Elapsed time after starting the engine	120 seconds*1	—
	180 seconds*2	
	200 seconds*3	
Engine coolant temperature	140ºF (60ºC)	212ºF (100ºC)
Intake air temperature	32ºF (0ºC)	—
Engine speed	1,150 rpm	3,000 rpm
MAP value	27 kPa (199 mmHg, 7.9 in.Hg)	—
Vehicle speed	19 mph (30 km/h)	62 mph (100 km/h)
Fuel trim	0.73	1.47
Fuel feedback	Closed loop*2, *3	
	Closed loop at stoichiometric*1	
Monitoring priority	Primary HO2S*2, *3, EVAP, Catalyst System, A/F Sensor*1	
No active DTCs	ECM/PCM, Primary HO2S*2, *3, Primary HO2S Heater*2, *3, A/F Sensor*1, A/F Sensor Heater*1, Secondary HO2S Heater, MAP, CKP, ECT, TP, CYP, IAT, EGR, BARO, VTEC System, Fuel System, Misfire	

*1: F23A4 engine
*2: F23A1 engine
*3: F23A5 engine

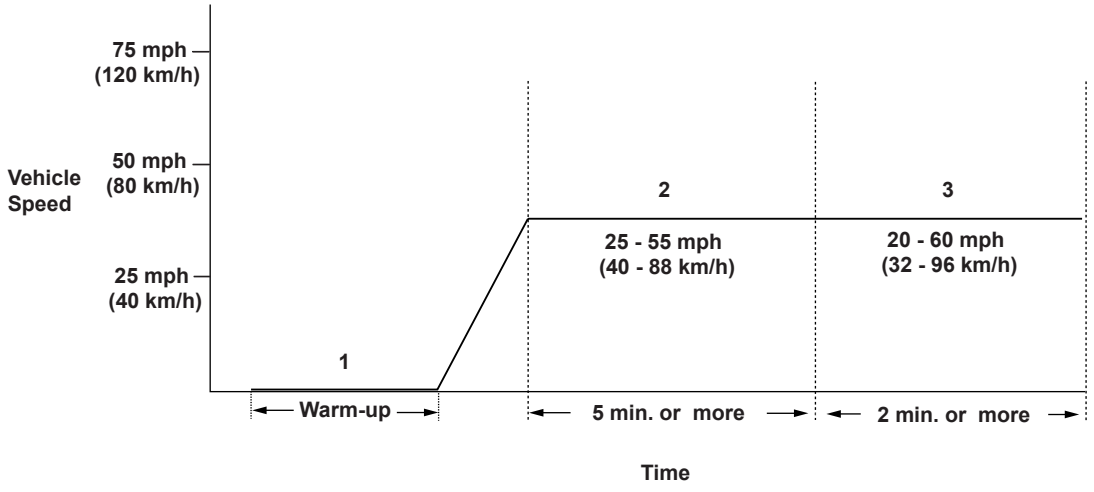
Malfunction Threshold

Secondary HO2S output voltage (x) remains in the range shown for each engine speed and MAP value.

		1,500 rpm	2,500 rpm*1	3,000 rpm*2, *3
MAP value 48 kpa (360 mmHg, 14.2 in.Hg)	ZONE 2	0.30 V < x < 0.58 V 0.30 V < x < 0.66 V*1	0.30 V < x < 0.60 V	0.30 V < x < 0.54 V
	ZONE 3	0.59 V < x < 0.80 V 0.67 V < x < 0.80 V*1	0.61 V < x < 0.80 V	0.55 V < x < 0.80 V
MAP value 68 kpa (510 mmHg, 20.1 in.Hg)	ZONE 2	0.30 V < x < 0.54 V 0.30 V < x < 0.62 V*1	0.30 V < x < 0.58 V	0.30 V < x < 0.50 V
	ZONE 3	0.55 V < x < 0.80 V 0.63 V < x < 0.80 V*1	0.59 V < x < 0.80 V	0.51 V < x < 0.80 V

*1: F23A4 engine
*2: F23A1 engine
*3: F23A5 engine

Driving Pattern



P0137-9950

1. Start the engine. Hold the engine at 3,000 rpm with no load (in park or neutral) until the radiator fan comes on.
2. Drive the vehicle at a speed between 25 - 55 mph (40 - 88 km/h) for at least 5 minutes.
3. Then, drive immediately at a steady speed between 20 - 60 mph (32 - 96 km/h) for at least 2 minutes.

- If the EVAP monitor runs instead of the HO2S monitor, turn the engine off, then restart it, and the HO2S monitor will restart.
- If you have difficulty duplicating the DTC, retest after turning off electrical components such as the audio system and A/C, and try a different gear position.
- Drive the vehicle in this manner only if the traffic regulations and ambient conditions allow.

Diagnosis Details

Conditions for illuminating the MIL

When a malfunction is detected during the first drive cycle, a Temporary DTC is stored in the ECM/PCM memory. If the malfunction recurs during the next (second) drive cycle, the MIL comes on and the DTC and the freeze frame data are stored.

Conditions for clearing the MIL

The MIL will be cleared if the malfunction does not recur during three consecutive trips in which the diagnostic runs.
The MIL, the DTC, the Temporary DTC, and the freeze frame data can be cleared by using the scan tool Clear command or by disconnecting the battery.